



EXPERIMENT NO. 6 BERNOULLI'S THEOREM DEMONSTRATION

OBJECTIVE:

This activity aims to determine the total head at various cross-sections of a passage of varying cross-section.

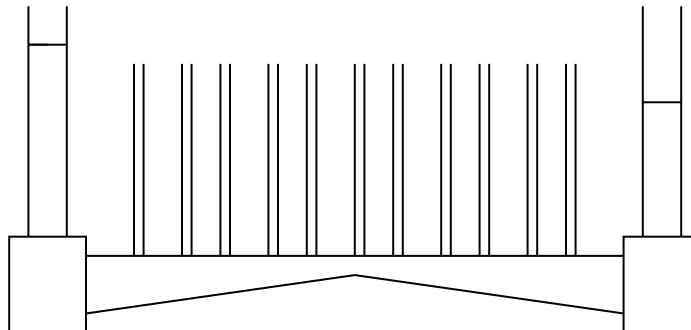
APPARATUS AND SUPPLIES

Bernoulli's Theorem Apparatus
Hydraulics bench
Stop Watch

PROCEDURE

1. Set up the apparatus
2. Start the pump.
3. Regulate the flow to fill the header tank and maintain it in a steady level. The flow through the channel will be quite rapid and the pressure at the throat may be too low to show on the manometer tube.
4. Increase the back pressure in the channel and outlet tank by slowly closing the drain cock. This will tend to raise the level in the inlet tank so the control valve should also be carefully regulated.
5. Adjust both valve and cock until there is the widest possible difference in pressure between the inlet and the throat of the channel with the water level visible in every manometer tube. Check carefully that levels are static and not subjected to "creep".
6. Measure the height of the water level in each manometer tube and record on the test sheet.
7. Measure the height of the water level in both the inlet and the outlet tanks and time the flow rate of the water. Record on the test sheet.
8. Close the main valve and switch off the pump.

DISCUSSION:



DATA AND RESULTS:

Table 6.1 – Determination of the Total Head at various Cross-sections of a Passage of Varying Cross-section

<i>Trial</i>	<i>Time to Collect, s</i>	<i>Volume, m³</i>	<i>Flow rate, m³/s</i>	<i>Tapping point</i>	<i>Distance into duct, m</i>	<i>Area of duct, m²</i>	<i>Static head</i>	<i>Velocity</i>	<i>Velocity head</i>	<i>Total head</i>
				1	0.0000	490.9x10 ⁻⁶				
				2	0.0603	151.7x10 ⁻⁶				
				3	0.0687	109.4x10 ⁻⁶				
				4	0.0732	89.9x10 ⁻⁶				
				5	0.0811	78.5x10 ⁻⁶				
				6	0.1415	490.9x10 ⁻⁶				
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				6	0.1415	490.9x10 ⁻⁶				

PRECAUTION

1. Before turning the pump of the hydraulics bench on be sure that the gate valve is closed to avoid accident.
2. Remove any trapped air inside by tapping or by using a bubble extracting device before getting the readings.

CLEANING PROCEDURE

Remove water from the apparatus and dry them thoroughly before returning them.



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BERNOULLI'S THEOREM DEMONSTRATION

Year and Section	Date Started
Group Number	Date Finished
Group Members	Date Submitted

6.1 DATA AND RESULTS:

Table 6.1 – Determination of the Total Head at various Cross-sections of a Passage of Varying Cross-section

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6.2 FORMULAS AND COMPUTATIONS:

6.3 DRAWINGS/SKETCHES/DIAGRAMS/GRAPHS:

6.4 SOURCES OF ERRORS:

6.5 REMARKS/CONCLUSION: